

HIGH POWER HIGH EFFICIENCY CLADDING PUMPING FIBER LASER

Abstract:

In the present invention, methods and apparatus for making efficient cladding pumping fiber lasers is disclosed. In particular, new fiber cladding geometry and method of construct fiber lasers and amplifiers using the laser fibers of the current invention are disclosed. The aspects of the present invention will facilitate the realization of high-efficiency and high-power fiber lasers and amplifiers. In the present invention, cladding boundary geometry structures that can prevent the formation of local modes are disclosed. Thus the pumping laser coupling method can be used for the construction of high-efficiency fiber lasers. Thus, the fiber lasers of this invention may comprise a laser fiber with its core doped with active species, having an asymmetric and symmetry-broken inner cladding or a multiple-imaging inner cladding surrounding said core, a laser diode array, reflector means at both ends of said laser fiber, and coupling optical system disposed between said laser diode array and the aperture of said laser fiber for coupling the pump beam from said laser diode array through a reflector into said inner cladding.